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Futatsuhashi

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(54) **SIDE SILL GARNISH HAVING SOUND ABSORBING MEMBER WHICH INCLUDES OUTER PERIPHERAL RIGID PORTIONS**

(75) Inventor: **Akira Futatsuhashi**, Utsunomiya (JP)

(73) Assignee: **Honda Motor Co., Ltd.**, Tokyo (JP)

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B60R 27/00 (2006.01)

(52) **U.S. Cl.** **296/209**; 296/193.05; 296/203.03

(58) **Field of Classification Search** 296/203.03, 296/209, 193.05
See application file for complete search history.

(56) **References Cited**

U.S. PATENT DOCUMENTS

2,212,551 A * 8/1940 Reid 296/209
5,288,121 A * 2/1994 Graves 296/209
2004/0084820 A1 * 5/2004 Kato et al. 267/141
2005/0218700 A1 * 10/2005 Yamamoto et al. 296/209

FOREIGN PATENT DOCUMENTS

JP 2004-168134 6/2004

* cited by examiner

Primary Examiner—Lori L. Coletta
(74) *Attorney, Agent, or Firm*—Rankin, Hill, Porter & Clark LLP

(57) **ABSTRACT**

A side sill garnish at the outside of a side sill of a vehicle has a garnish main body as an outer surface of the side sill garnish; and a sound absorbing member provided on the inside of the garnish main body, and has a rigid member at an outer periphery of the sound absorbing member. The rigid member is attached to the garnish main body. Preferably, the sound absorbing member is made of a foam material, and the rigid member is formed by compressing the foam material. For example, the sound absorbing member, made of a foam material, has portions for fastening the sound absorbing member to the main body using clips; and these portions are formed by compressing the foam material. In another example, the sound absorbing member has rigid members on opposite sides in the outer periphery, and the rigid members are attached to the main body.

13 Claims, 3 Drawing Sheets

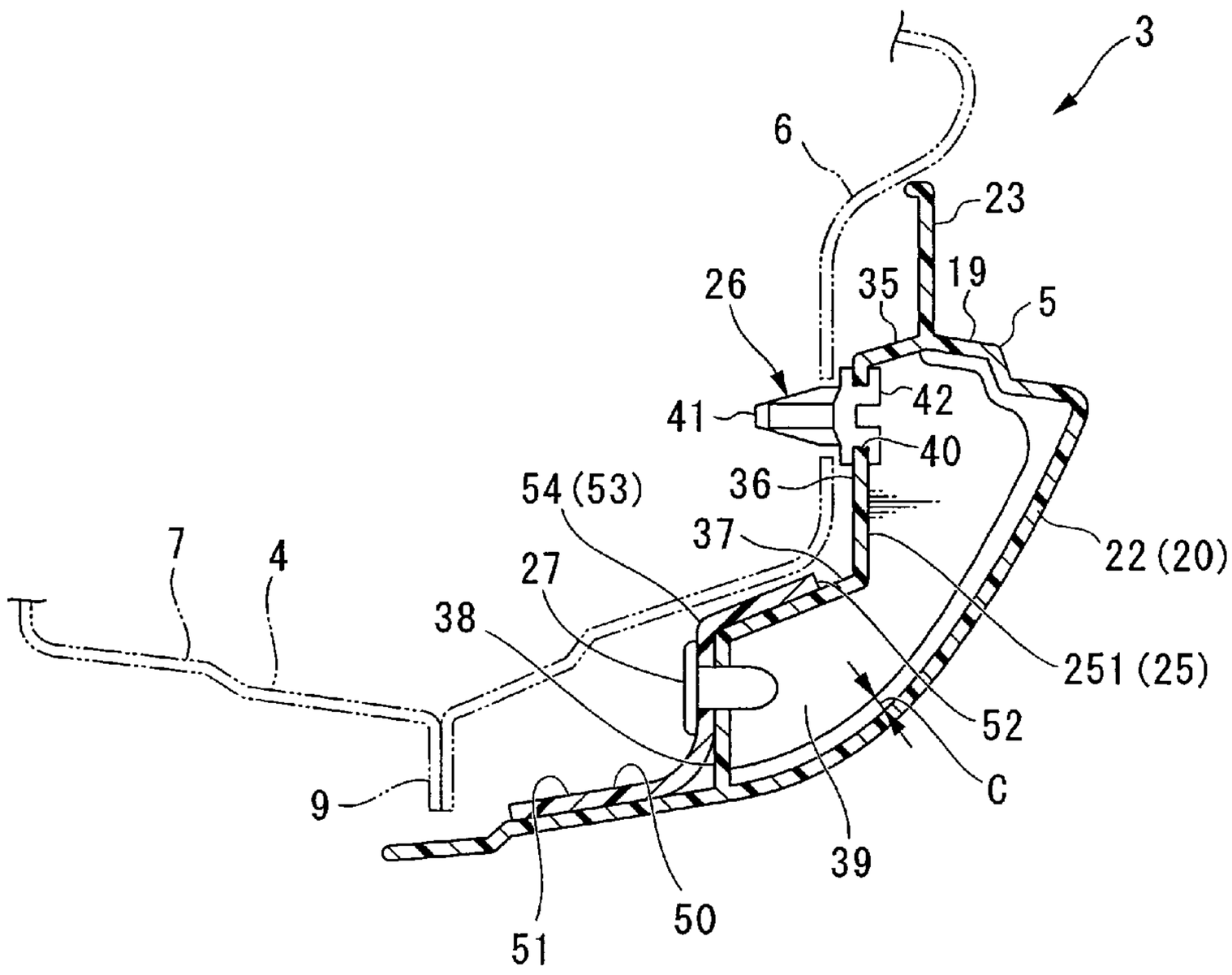

FIG.1

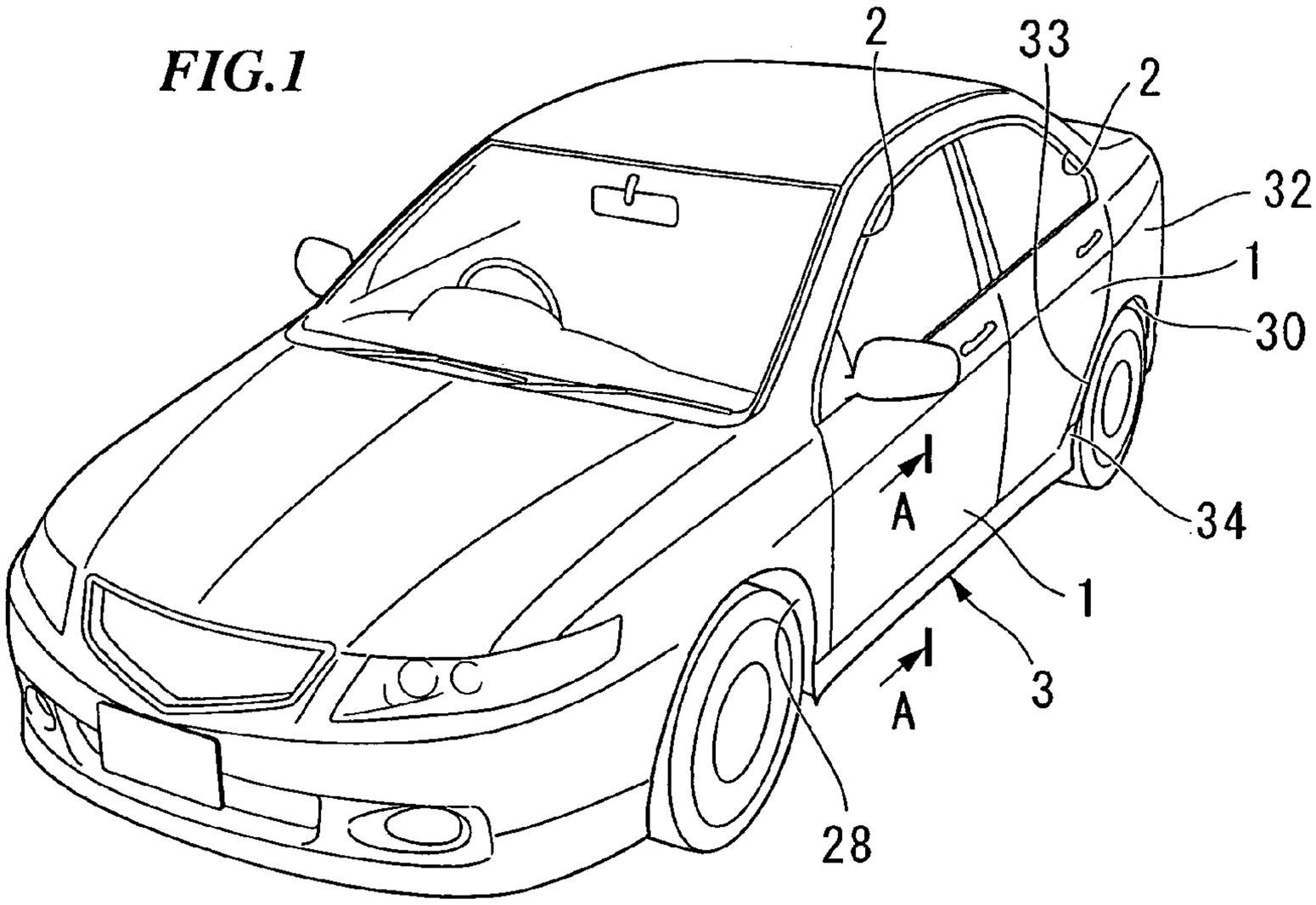
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FIG.2

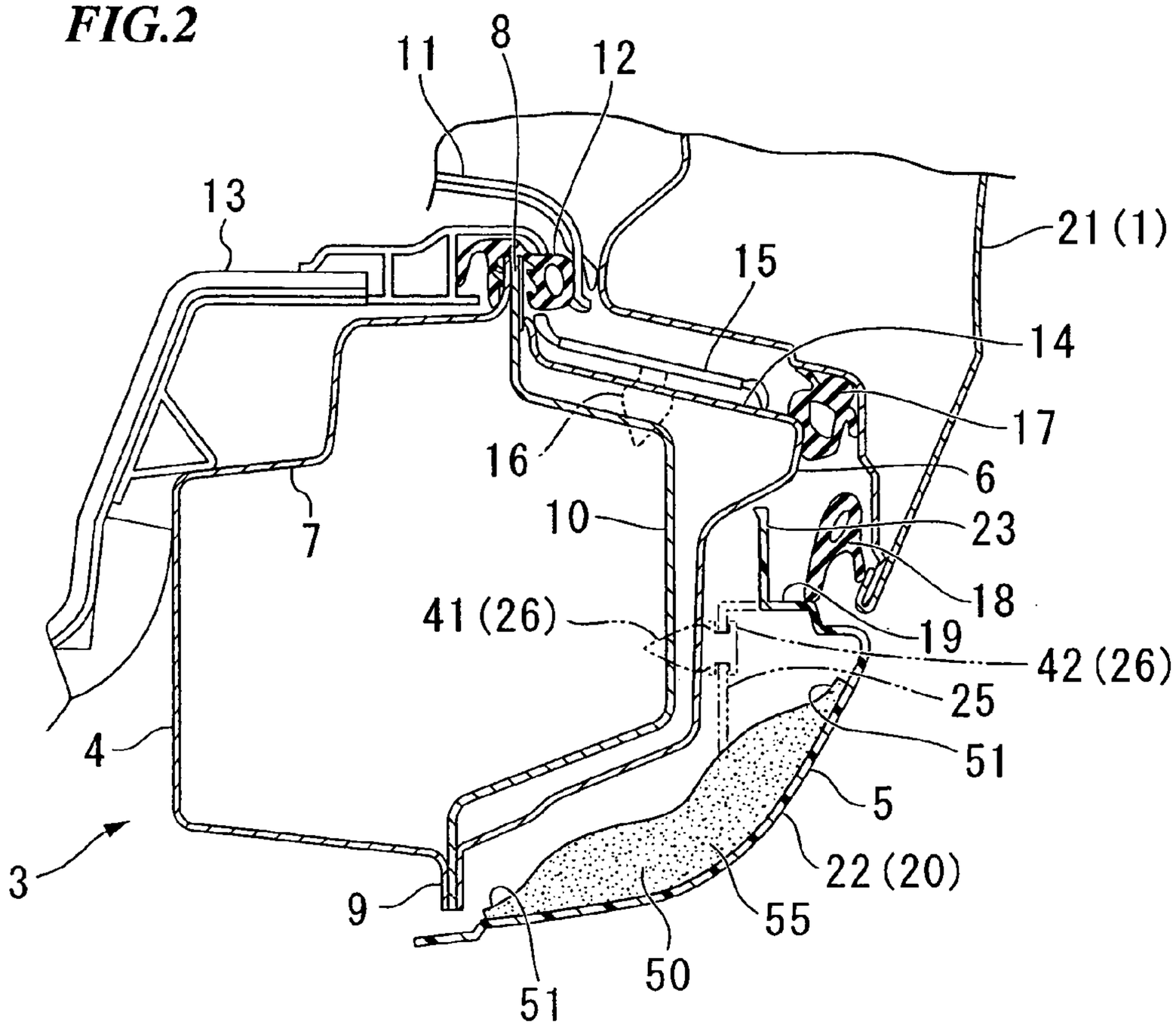
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FIG.3

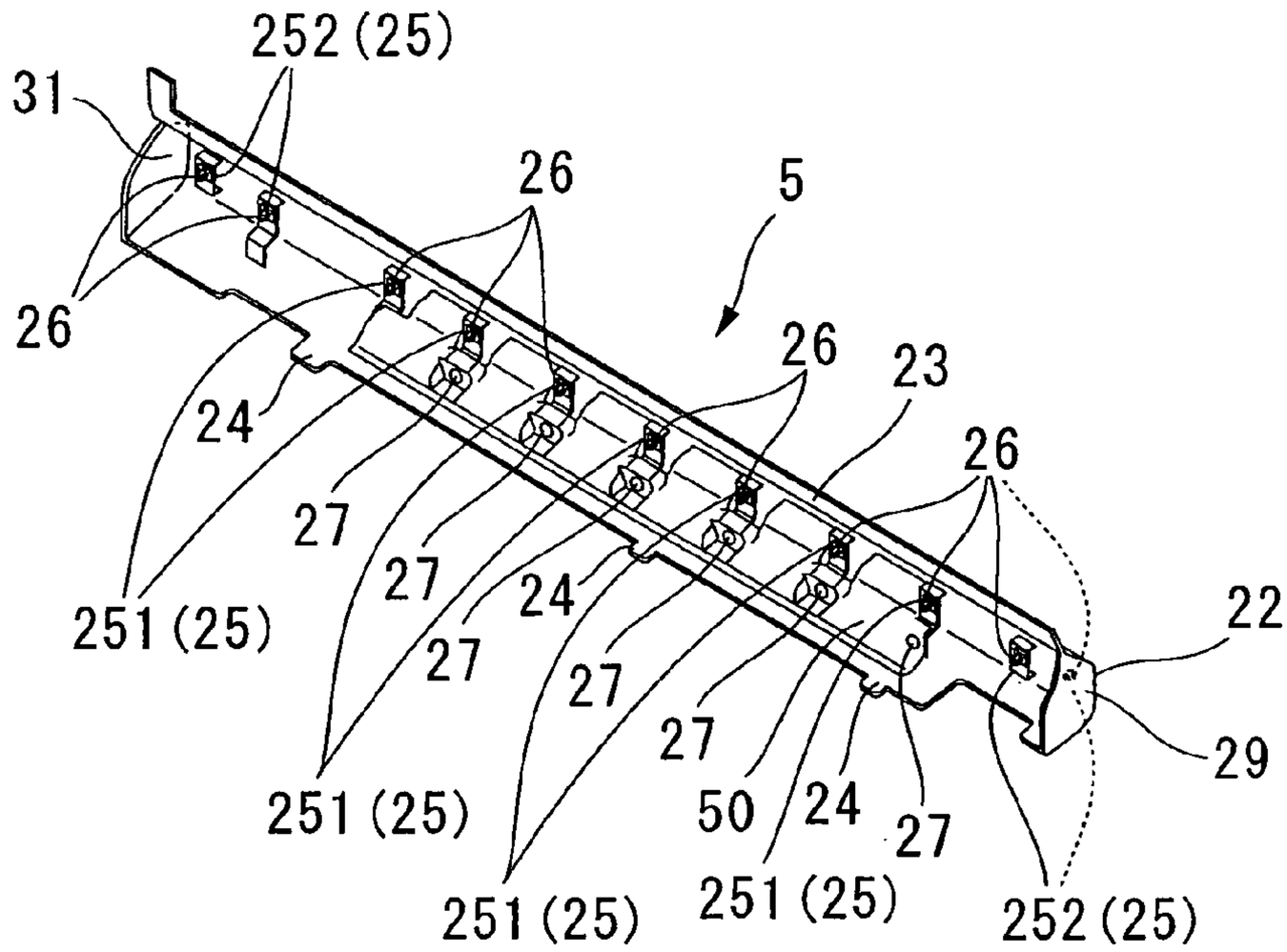
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FIG.4

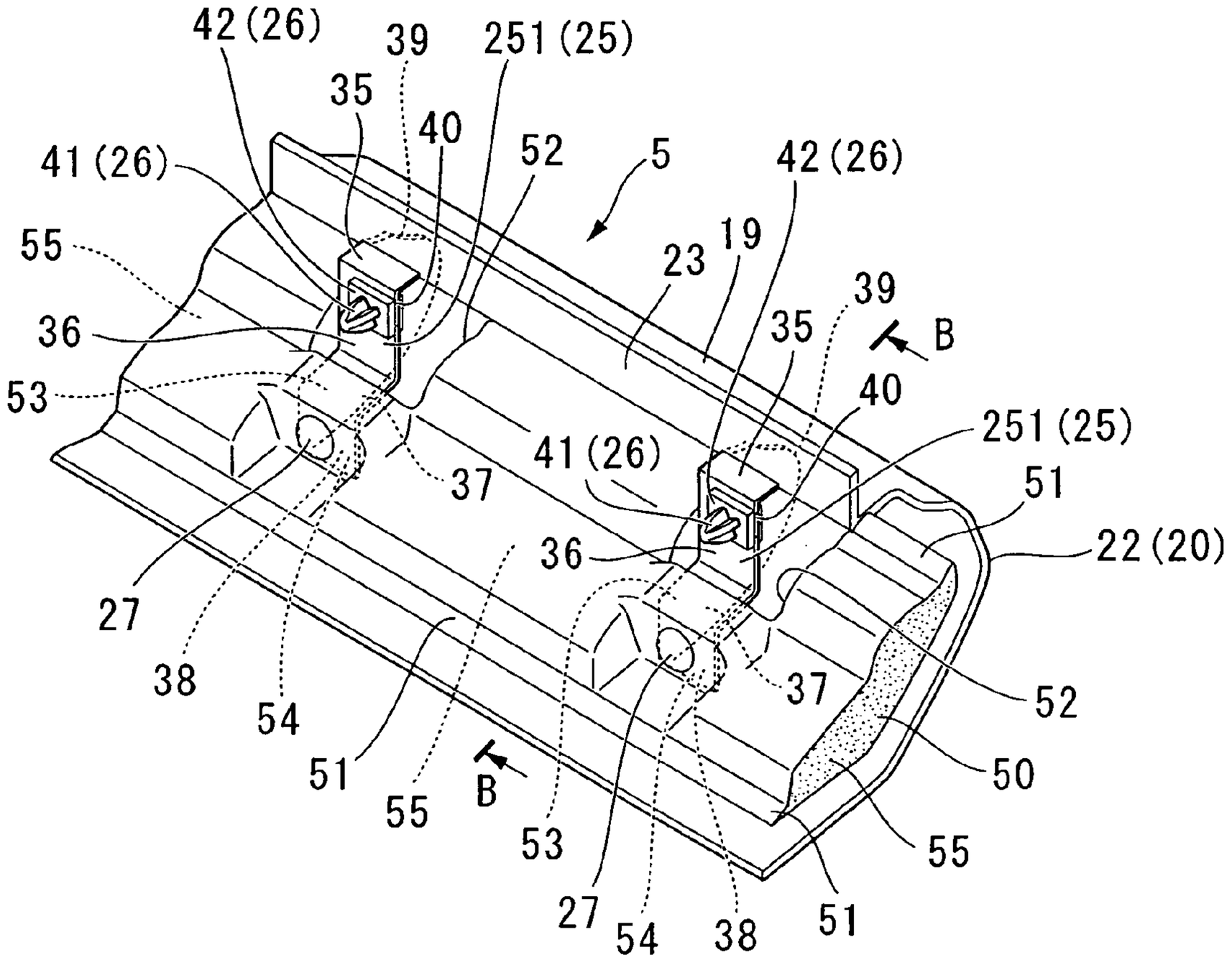
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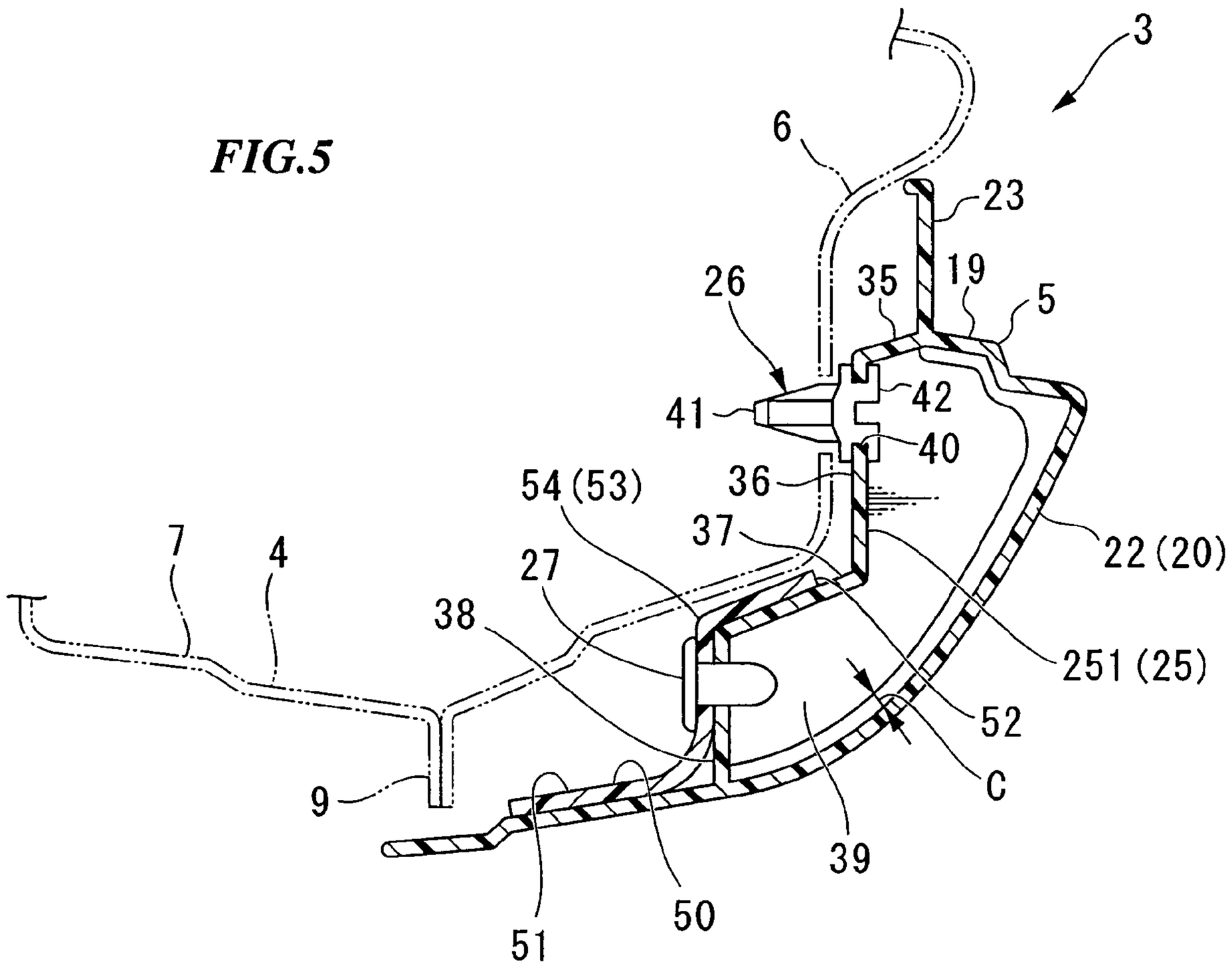
FIG.5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SIDE SILL GARNISH HAVING SOUND ABSORBING MEMBER WHICH INCLUDES OUTER PERIPHERAL RIGID PORTIONS

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a side sill garnish used in a vehicle such as an automobile.

Priority is claimed on Japanese Patent Application No. 2004-282350, filed Sep. 28, 2004, the content of which is incorporated herein by reference.

2. Description of Related Art

Generally, a side sill garnish provided in a vehicle such as an automobile employs a structure having a door seal for preventing water, dust, and external sound from entering the vehicle. In particular, in order to block external sound which can enter through a minute gap or hole, various methods have been proposed. For example, a side sill garnish provided at the outside of the side sill is effectively used by attaching a sound absorbing member to an inner face of the side sill garnish (see Japanese Unexamined Patent Application, First Publication No. 2004-168134).

In the above conventional technique, sound absorbing performance can be improved by increasing the volume of the sound absorbing member. However, in this case, rigidity of the side sill garnish may be insufficient. In addition, brackets or the like are necessary for attaching the sound absorbing member to the side sill garnish; thus, the number of parts and the weight of the vehicle are increased.

SUMMARY OF THE INVENTION

In light of the above circumstances, an object of the present invention is to provide a side sill garnish for securing necessary rigidity while decreasing the number of parts, improving efficiency in work for attaching a sound absorbing member, and reducing the weight of the vehicle as much as possible.

Therefore, the present invention provides a side sill garnish (e.g., a side sill garnish **5** in an embodiment explained later) provided at the outside of a side sill section (e.g., a side sill section **3** in the embodiment) of a vehicle, comprising:

a garnish main body (e.g., a garnish main body **20** in the embodiment) functioning as an outer surface of the side sill garnish; and

a sound absorbing member (e.g., a sound absorbing member **50** in the embodiment) which is provided on the inside of the garnish main body, and has a rigid member (e.g., rigid portions **50** in the embodiment) at an outer periphery of the sound absorbing member, wherein the rigid member is attached to the garnish main body.

Accordingly, due to the rigid member, considerable rigidity can be provided to the sound absorbing member. In addition, due to the rigid member at the outer periphery of the sound absorbing member, it is possible to prevent water, dust, and external sound from entering the vehicle. Therefore, the volume of the sound absorbing member can be increased, thereby improving the sound absorbing performance. Simultaneously, rigidity can be improved, and an increase in the weight of the vehicle can be reduced as much as possible.

Preferably, the sound absorbing member is made of a foam material, and the rigid member is formed by compressing the foam material. Accordingly, the rigidity of the sound absorbing member can be improved without using other parts, and an increase in the weight of the vehicle can be reduced as much as possible. Therefore, ease of attachment work can be improved.

Accordingly, the clip attachment portions for fastening the sound absorbing member to the garnish main body can be provided without using other parts; thus, the volume of the sound absorbing member can be maximized, and ease of attachment work can be improved. In addition, the clip attachment portions can be designed in consideration of expansion and contraction relating to thermal expansion, so as to strengthen the clip attachment portions. Furthermore, portions (of the sound absorbing member) except for the clip attachment portions can be effectively used as the sound absorbing member, thereby improving the sound absorbing performance.

In a typical example, the sound absorbing member has rigid members on opposite sides in the outer periphery, and the rigid members are attached to the garnish main body. In this case, preferably, the sound absorbing member is made of a foam material, and each rigid member is formed by compressing the foam material.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view showing a vehicle having a side sill garnish as an embodiment of the present invention.

FIG. **2** is a sectional view along line A—A in FIG. **1**.

FIG. **3** is a perspective view of the side sill garnish in the embodiment.

FIG. **4** is a partially enlarged view of FIG. **3**.

FIG. **5** is a sectional view along line B—B in FIG. **4**.

DETAILED DESCRIPTION OF THE INVENTION

Hereinafter, embodiments according to the present invention will be described with reference to the appended figures.

FIG. **1** is a perspective view showing a vehicle having a side sill garnish as an embodiment of the present invention. As shown in FIG. **1**, the vehicle has a side door **1**, an opening **2** to which the side door **1** is attached, and a side sill section **3** under the opening **2**.

FIG. **2** is a sectional view along line A—A in FIG. **1**. As shown in FIG. **2**, the side sill section **3** basically consists of a side sill **4** and a side sill garnish **5** which is attached to the outside of the side sill **4** and functions as an outer surface of the side sill section **3**.

The side sill **4** is a frame member of the vehicle body and has a closed-section structure consisting of an outer sill panel **6** provided at the exterior of the vehicle, and an inner sill panel **7** provided in the interior of the vehicle. Between the outer sill panel **6** and the inner sill panel **7**, a stiffener **10** is provided, which is supported at upper and lower joint flange portions **8** and **9**, respectively.

At the upper joint flange portion **8** of the side sill **4**, a vehicle body seal **12** is provided, which is in tight (or close) contact with an interior material **11** of the side door **1** when the side door **1** is closed. The upper joint flange portion **8** of the side sill **4**, which includes a base portion of the vehicle body seal **12**, is covered with a lining **13** extending toward the floor.

To an upper wall **14** of the outer sill panel **6**, a step garnish **15** is attached using a clip **16**. Close to the lower side of the step garnish **15**, a first door seal **17** and a second door seal **18** are provided, which are attached to a lower inner wall of the side door **1**. The first door seal **17** can make tight contact with the outer sill panel **6**, and the second door seal **18** can

make tight contact with an upper wall **19** of the side sill garnish which is attached at the outside of the outer sill panel **6**.

The side sill garnish is made of resin, and consists of a garnish main body **20** and a sound absorbing member **50** provided at the inside of the garnish main body **20**.

The garnish main body **20** has an outer wall **22** which bends in such a manner as to be continuous with a door skin **21** which functions as an outer panel of the side door **1**. On the upper portion of the outer wall **22**, a shield wall **23** is disposed at the inside of the second door seal **18** and is provided for preventing water or the like from entering the vehicle. The lower edge of the outer wall **22** extends to the vicinity of the lower joint flange portion **9** of the side sill **4**. The lower edge of the garnish main body **20** has attachment portions **24** which are attached to the inner sill panel **7** (see FIG. **3**, which is a perspective view of the side sill garnish **5**).

In the outer wall **22**, attachment portions **25** are formed at regular intervals and are positioned on the side of the outer wall **22** toward the interior of the vehicle. Due to clips **26** provided at the attachment portions **25**, the garnish main body **20** is fastened to the outer sill panel **6** and the stiffener **10** of the side sill **4**.

As shown in FIG. **3**, the attachment portions **25** are classified into (i) attachment portions **251** which also function as attachment portions for fastening the sound absorbing member **50** (explained later), and (ii) ordinary attachment portions **252** which do not function as attachment portions for fastening the sound absorbing member **50**. In the present embodiment, two ordinary attachment portions **252** are provided at each of the front and rear ends of the garnish main body **20** (i.e., a total of four attachment portions **252**), and seven attachment portions **251** are provided in the middle of the length (i.e., in the front-rear direction) of the garnish main body **20**.

The sound absorbing member **50** is arranged on the inside of the outer wall **22** of the garnish main body **20** and is attached to the attachment portions **251** of the garnish main body **20** using clips **27**.

More specifically, the garnish main body **20** has (i) a front wall **29** at the front end, which faces an inner wall of a front wheel housing **28**, and (ii) a rear wall **31** at the rear end, which faces an inner wall of a rear wheel housing **30** (see FIG. **1**). The upper edge of a rear end of the garnish main body **20** protrudes upward and functions as a portion of a front side **34** of a wheel arch portion **33** of a rear fender **32**.

FIG. **4** is a partially enlarged view of FIG. **3**. FIG. **5** is a sectional view along line B—B in FIG. **4**.

As shown in FIGS. **4** and **5**, each attachment portion **251**, which simultaneously functions as an attachment portion for the garnish main body **20** and an attachment portion for the sound absorbing member **50**, includes (i) a horizontal portion **35** extending from the base portion of the shield wall **23** (provided at the back side of the outer wall **22**) toward the interior of the vehicle, (ii) an attachment seating **36** extending downward from an end of the horizontal portion **35**, (iii) a ledge portion **37** extending from the attachment seating **36** toward the interior of the vehicle, and (iv) a seating face **38** extending downward from the ledge portion **37**. The lower edge of the seating face **38** is joined to the lower face of the outer wall **22**. In addition, a plate portion **39** is formed along the rear edge of the attachment portion **251**, and a clearance C (see FIG. **5**) is provided between the plate portion **39** and the inner face of the outer wall **22**. Due to the plate portion **39**, required rigidity of the attachment portion **251** is obtained, and generation of pits or the like on the surface of the garnish main body **20** is prevented.

On the attachment seating **36** of each attachment portion **251**, a notch portion **40** is formed, into which a clip **26** is inserted. In the notch portion **40**, the side toward the front or the back is open, and a base portion **42** of the clip **26** is slidably inserted into the notch portion **40** while a fitting portion **41** of the clip **26** protrudes toward the interior of the vehicle. The garnish main body **20** is fastened to the outer sill panel **6** using the clips **26** attached to the attachment portions **251** as explained above, and also the clips **26** attached to the ordinary attachment portions **252**. In addition, the stiffener **10** has holes for preventing contact between the heads of the clips **26** and the stiffener **10**.

The sound absorbing member **50** is made of a foam material (typically, a foam resin). As shown in FIGS. **3** to **5**, outer peripheries of the sound absorbing member **50** are compressed by thermal welding so as to produce thinner rigid portions **51** (i.e., rigid members) for improving rigidity. Instead of thermal welding, press molding may be performed for compressing the outer peripheries.

The sound absorbing member **50** has cut portions **52** for exposing the horizontal portions **35** and the attachment seatings **36** of the attachment portions **251** of the garnish main body **20** when the sound absorbing member **50** is attached to the garnish main body **20**.

In addition, portions of the sound absorbing member **50** corresponding to the ledge portions **37** and the seating faces **38** of the attachment portions **251** are also compressed similar to the above-described outer peripheries of the sound absorbing member **50**, so as to produce thinner rigid portions **53** (i.e., rigid members) for improving rigidity.

In each rigid portion **53**, a portion corresponding to the seating face **38** functions as a clip attachment portion **54** (which is a rigid member), and a clip **27** is inserted into the clip attachment portion **54** toward the exterior of the vehicle. The sound absorbing member **50** is fastened to the garnish main body **20** by the clips **27**. Therefore, in the sound absorbing member **50**, a sound absorbing portion **55**, which expands toward the inside of the outer wall **22** of the garnish main body **20**, is formed in the areas except for the clip attachment portions **54**, the ledge portions **37**, the cut portions **52**, and the rigid portions **51** at the outer peripheries. The clip attachment portion **54** is positioned in the vicinity of each cut portion **52**, which is a portion of the outer periphery of the sound absorbing member **50**, and thus the clip attachment portion **54** is also a portion of the outer periphery of the sound absorbing member **50**.

According to the above embodiment, in the side sill garnish **5**, the sound absorbing member **50** having the rigid portions **51** and **53** is provided on the inside of the garnish main body **20**, thereby providing considerable rigidity to the sound absorbing member **50** itself. In addition, the rigid portions **51** are attached in such a manner as to make tight contact with the inner wall of the garnish main body **20**. Therefore, the rigidity of the entire portion (i.e., the side sill garnish) can be improved, and it is possible to reliably prevent water, dust, and external sound from entering the vehicle from the rigid portions **51** making tight contact with the inner wall of the garnish main body **20**. Accordingly, even when the volume of the sound absorbing member **50** is increased, the rigidity is not degraded, and thus the sound absorbing performance can be improved.

The sound absorbing member **50** is made of a foam resin material, and the rigid portions **51** and **53** are formed by compressing the foam resin material. Therefore, it is possible to improve the rigidity of the sound absorbing member

50 without using other parts. Accordingly, in comparison with a case using other parts for improving the rigidity, the number of parts can be reduced, ease of attachment work can be improved, and increase in the weight of the vehicle can be reduced as much as possible.

In particular, the clip attachment portions **54** for attaching the sound absorbing member **50** to the garnish main body **20** are formed by compressing the foam material; thus, no other parts are necessary, and performance of attachment work can be improved. In addition, the clip attachment portions **54** can be provided in the vicinity of the center line of the sound absorbing member **50** in the vertical direction, that is, in the vicinity of the center of gravity of the sound absorbing member **50**, thereby minimizing the number of points at which the clips **27** are attached.

In addition, the side sill garnish **5** is a relatively long member, and a margin in consideration of expansion and contraction relating to thermal expansion must be secured. However, both the garnish main body **20** and the sound absorbing member **50** are made of resin. Therefore, even when an amount of expansion and contraction is different between the garnish main body **20** and the sound absorbing member **50**, the difference is very small. Therefore, in comparison with a case of attaching both via another metal member, the strength of the attached portions between the garnish main body **20** and the sound absorbing member **50** can be improved.

Furthermore, in the notch portions **40** (formed in the garnish main body **20**) for the clips **26**, the side toward the front or the back is open (i.e., the notch portions **40** are formed in the length of the garnish main body **20**); thus, expansion and contraction relating to thermal expansion of the garnish main body **20** with respect to the side sill **4** are permissible. In addition, the sound absorbing member **50** can have thick portions except for the clip attachment portions **54**; thus, a higher sound absorbing performance can be obtained.

While preferred embodiments of the invention have been described and illustrated above, it should be understood that these are exemplary of the invention and are not to be considered as limiting. Additions, omissions, substitutions, and other modifications can be made without departing from the spirit or scope of the present invention. Accordingly, the invention is not to be considered as being limited by the foregoing description, and is only limited by the scope of the appended claims.

What is claimed is:

1. A side sill garnish provided at the outside of a side sill section of a vehicle, comprising:

a garnish main body functioning as an outer surface of the side sill garnish; and

a sound absorbing member made of a foam material, which is provided on the inside of the garnish main body, said sound absorbing member having a rigid member at an outer periphery of the sound absorbing member, wherein the rigid member is attached to the garnish main body.

2. The side sill garnish according to claim **1**, wherein the rigid member is formed by compressing the foam material.

3. The side sill garnish according to claim **1**, wherein:

the sound absorbing member has clip attachment portions for fastening the sound absorbing member to the garnish main body using clips; and

the clip attachment portions are formed by compressing the foam material.

4. The side sill garnish according to claim **1**, wherein the sound absorbing member has rigid members on opposite sides in the outer periphery, and the rigid members are attached to the garnish main body.

5. The side sill garnish according to claim **4**, wherein each rigid member is formed by compressing the foam material.

6. The side sill garnish according to claim **1**, wherein said garnish main body includes an outer wall and an attachment portion, said attachment portion being integrally secured to the outer wall and extending toward the side sill, said attachment portion comprising:

a first portion that receives a garnish mounting clip to secure the garnish main body to the side sill; and,

a second portion that receives a sound absorbing member mounting clip to secure the sound absorbing member to the garnish main body attachment portion.

7. The side sill garnish according to claim **6**, wherein a plate portion extends from the attachment portion toward an inner surface of the outer wall, said plate portion being spaced from the inner surface of the outer wall to define a clearance.

8. The side sill garnish according to claim **6**, wherein the rigid member is formed by compressing the foam material.

9. The side sill garish according to claim **6**, wherein:

the sound absorbing member has a clip attachment portion for fastening the sound absorbing member to the attachment portion of the garnish main body via the sound absorbing member mounting clip; and

the clip attachment portion is formed by compressing the foam material.

10. The side sill garnish according to claim **1**, wherein said garnish main body has a length dimension and includes an outer wall and a plurality of attachment portions, said attachment portions, which are provided at spaced intervals along the length of the garnish main body, being integrally secured to the outer wall and extending toward the side sill, each of said attachment portions comprising:

a first portion that receives a garnish mounting clip to secure the garnish main body to the side sill; and,

a second portion that receives a sound absorbing member mounting clip to secure the sound absorbing member to the garnish main body attachment portion.

11. The side sill garnish according to claim **10**, wherein each of the attachment portions includes a plate portion that extends from the first and second portions toward an inner surface of the outer wall, said plate portion being spaced from the inner surface of the outer wall to define a clearance.

12. The side sill garnish according to claim **10**, wherein the rigid member is formed by compressing the foam material.

13. The side sill garnish according to claim **10**, wherein:

the sound absorbing member has a plurality of clip attachment portions for fastening the sound absorbing member to the attachment portions of the garnish main body via the sound absorbing member mounting clips; and

the clip attachment portions are formed by compressing the foam material.

* * * * *